

# Week 2: Mirror Image

(Abecedarians & Apprentices)

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- Exercises: Pgs 5-7
- Drawing and Math pg8
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### MATERIALS NEEDED

- -Paper
- -Pencils
- -Colored Pencils, Markers, Crayons (Optional!)
- -Visuals for class, whether drawn from this tutorial or supplemented by you or your director.

## *Special Note*

*While not technically necessary, this exercise is one that can benefit from having printed patterns to right-and-left-hand specific. As a left hander, drawing in the missing right hand of a pattern requires me to cover the pattern with my left hand, which makes things more difficult to copy! I've included right-and-left patterns, but in the case that a particular pattern runs out for a right or left-handed student during class or the week, you can always **rotate** the pattern upside down (which will require you to draw it both upside down and matching the pattern.) and have the student and/or parent complete the pattern.*

*This will not negatively impact the exercise at all, in fact, it'll foreshadow next week's lesson!*

*[Read the quote below (pg, 12 )to start]*

*"For me, drawing generates thinking and vice versa." --Helmut Jahn, Architect.*

**Tutor:** Last week, we learned you can break any image down unto OiLS. Does anyone remember what OiLS stands for?

*[Ovals, dots, straight lines, angled lines, and curves. Put up the OiLS poster if you like at this time.]*

**Tutor:** Today, we're going to play with mirror images. Given an image that's been broken in half, you're going to draw the other half. Do you know what an object that is the same on one side and the other is called?

**Symmetrical.**

<show vocab paper >

A symmetrical object you could cut in half and have two halves that look like mirror images of each other. Is this butterfly symmetrical?

<Yes>

How about this starfish? Is it symmetrical?

<Yes>

Are there a few lines I could cut this starfish in half and still have symmetry?

<yes (about five lines, depending on the starfish)

What about this reflection of the trees on the water? Is that symmetrical?

<Yes>

Yes, that type of symmetry is really easy to spot in the real world? Can you think of other things that are symmetrical?

< Faces, triangles, most mammals (if viewed from the front, or overhead)>

Now, what would happen if I had one-half of a picture of a butterfly? Could I use the half of the picture I had to figure out how the whole butterfly looks?

<Yes!>

Yes, so that's what we're going to be doing today. Starting with some shapes, and, if we have time, building up to some animals, we're going to practice filling in a half-picture to make a symmetrical whole.

Why would we do this?

Well, did you know that your brain can be lazy and jump to simple solutions just to save time and move on to something more interesting? (And here you thought it was just you vs. chores/homework. It can also be you v. your brain) Your brain constructs simple patterns which some scientists call "icons". (From the Greek *eikon* which means, "image") .<sup>1</sup>

If I draw/show you this: [*Leaf icon, eye icon*] do you know what it is?

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<sup>1</sup> Other scientists call these patterns "schema", which the Latin for "figure" or "appearance" /

<show the Leaf/Eye icon page, (pg. 13) or draw similar icons on the board>

**Tutor:** Right, it represents a leaf and that one, an eye. These simple drawings look enough like leaves and eyes that your brain can identify them and move on. But a real leaf, a real eye, looks a little different, doesn't it?

<show the photos and line drawings based on leaves and eyes (pg 14)>

Whether you look at the photo or drawing, we can see real leaves and eyes are more complicated than the icon patterns, even though they can look basically similar. Breaking the image forces the brain to slow down and actually *think* through what it is seeing.

Which brings us back to today's lessons: drawing the mirror image, the other, symmetrical side of something.

When we break a recognizable image in half, our brain has a harder time recognizing it at an icon pattern level. Because of that, you can more easily see the OILS that make up the half-image.

And when you have to hand-draw the other half of that image, the part of our brain that wants to just make a simple icon pattern and move on has to stop and really look:

- Look at the length of the lines, relative to the lines around them.
- Look at the arc of a curve,
- Look at the angles and spaces that make up an image.

Try to look at the image as a collection of lines and angles. Don't say to yourself: "okay, I'll just draw the other half of this house, face, street, ect." Ask yourself, "how long is this line? How sharp is that angle?" Try to build your other half image line by line, or small section by small section, rather than trying to build "this thing" or "that thing." <sup>2</sup>

Above all, keep in mind **that learning anything, including drawing, is about the PROCESS and PROGRESS, not (necessarily) the PRODUCT.** Even artists have noticed that sometimes, Progress can be slower than we may want:

<show Koblin quote( pg 15)>

*"The trouble with progress is that it tends to happen slowly and quietly. It's not necessarily going to shout about itself, or make the nightly news ..."* -Aaron Koblin

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<sup>2</sup> Because when you say to yourself "okay, I'll draw a roof here", your brain will try to revert to your internal "roof icon" and just draw it in quickly to be done. When you say "How long is that top line? Bottom line? What is the angle of the connecting line?" you may find the resulting roof more correctly matches your original image.

Keep at it, and keep practicing. If you don't like the resulting drawing, remember Chuck Jones, and get the "bad drawings out". Even bad drawings, if you worked at them, help you draw better in the future!

## Review:

- What do we call an object that you can cut in half and it looks like a mirror image on both sides of that line? <Symmetrical/ Symmetry>
- Drawing is about ...? <Process and Progress, not necessarily Product>

What is the point to this exercise?

While we are only just beginning to study the brain and understand how it works, there is evidence that the brain has several modes of "thinking".

If you've ever heard of someone being "left-brained" or "right-brained", you may also have heard that "left-brained" people are more logical, mathematical, methodic, and "right-brained" people are more artistic, creative, spontaneous.

We now know that brains are highly individualistic, and you use both sides of the brain. But the modes of thinking DO appear, it's just they are not attached exclusively to one side of the brain or another.

The Local-Logic mode of thinking likes step-by-step instructions, efficiency, checklists, rules. THIS is the mode that over-simplifies things.

The Global-Gestalt mode of thinking likes complexity, losing time in wonder, invention, possibilities. THIS is the mode that thrives when you draw.

But...Local-Logic is the mode that is easiest to test and assess. When was Napoleon crowned Emperor of France? 1803. BOOM! DONE! Success, move on!

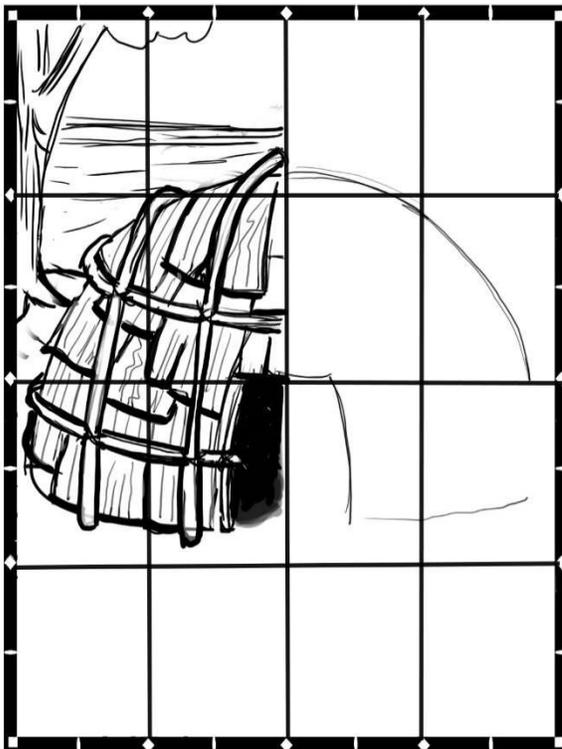
But ask, "What would have happened at the Battle of Waterloo if Napoleon had WON?" and Global Gestalt gets involved. "Possibilities, possibilities...would he go home? Would he invade England? What if he had?:" And several hours of conversation and debate later, you might not have a "correct answer" but you will have a deeper understanding of Napoleon, the 19<sup>th</sup> century, country relationships, and more, as you debate what he might have done based on extrapolation of him and his earlier life, European borders and politics, and more (Alternative history books thrive on this!) Because Local-Logic can be better assessed through multiple-choice tests and the like, it gets stronger and becomes the default-mode for most of our ways of thinking. By destroying half of a common image, we hamstring Local-Logic's ability to push Global-Gestalt to the side, take over, and move on. By forcing Local-Logic to sit out, we let Global-Gestalt do what it's better at, and the more Global-Gestalt gets to take time, observe, think through possibilities, the better your art will be.

# Exercises

## Exercise #1: The History Activity, Pgs. 16-22

There are four patterns included for this first exercises, each increasing in difficulty and details, and each also has left and right hand variations.

- Ex. # 1 Simple Shapes, left and right, Pgs 17-18
- Ex. #1: Lamb cartoon, left and right, pgs. 19-20
- Ex. # 1: Lion cartoon, left and right variations pg 21-22
- Ex. #1: Butterfly and Moth, left and right pg 23-34



**What's with the funny frame?** Some people have a hard time freehanding their first mirror images, or are quite anxious over “getting it right”. If this is the case, the frame can help you “grid” an image.

You can draw a grid by matching diamonds to diamonds, football-shape to football-shape, or the corner squares to each other—or any combination. Drawing grids has been a traditional method of accurately transferring a sketch to another surface for continued work, or correctly scaling an image by hand. It will help students by giving them “measuring marks” to work with. “That curve crosses where these two grid lines almost touch...the horizon is halfway between the top of the frame and the first grid line down...” ect.

**You can:**

- Use just the corner squares for an “X-shaped Grid” (helps to keep some things centered)
- Use just the diamonds for a large grid (shown on the wetu image, PAGE NUMBER)
- Use the football/leaf shape grid • Any combination thereof

The more lines you draw, the harder it will be to erase the grid later, so if it’s wanted, use it, but try to do a second version of the exercise free handed later.

## Exercise #2: The “Official” Art Mirror Image Exercise Pgs. 24-26

Yes, “official” is in quotations because there’s nothing officially official about it, but so many art books, schools, and courses use this example, (which dates back to at least the 18<sup>th</sup> century) I thought we may as well throw it in here.

This is called the Face-Vase exercise. Look at the lines on pages and try to copy a mirror image of it. The internal question then becomes, is this a pair of faces looking at each other, or is it a fancy vase/goblet in the middle? Being able to freely switch between seeing both is supposed to help your brain convert from seeing a “pattern image” to seeing how sections of lines and shapes that can be placed to form a larger image.<sup>3</sup>

These exercises are simple and relatively quick compared to the others, so you can start with this and hand out exercise #1 after or, you can do a variation on what Betty Edwards talks through in her book “Drawing on the Right Side of the Brain”.

### Exercise #2A:



*Edgar Degas, from Cycle 2, used a grid to transfer this ballerina. Many “great artists” used-and still use-grid to help them measure proportions or transfer a drawing from one surface to another, often final, surface.*

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<sup>3</sup> Betty Edwards, New York Times Bestselling author/art teacher of the book ‘Drawing on the Right Side of the Brain’ talks about using the face-vase exercise to force someone to switch from using the more commonly trained and rehearsed ‘L-Mode’ (Local-Logic, verbal, mathematically driven) to the less-trained R-Mode (Global-Gestalt, spatial, problem solving, out-of-the-box creative driven.) In her exercise, she mentions many students have to switch between seeing both profile and vase in order to complete the exercise correctly, rather than just copying one or the other.

Ask your students (and their parents) to draw a profile on one side of their paper, leaving the other side blank (Left handers should draw on the right hand side, leaving the left-hand side blank and right handers should draw on the left-hand side, leaving the right side blank.)

Once they've done so, now complete the other side, to mirror the first profile.

### Exercise #3: A Mirror Game

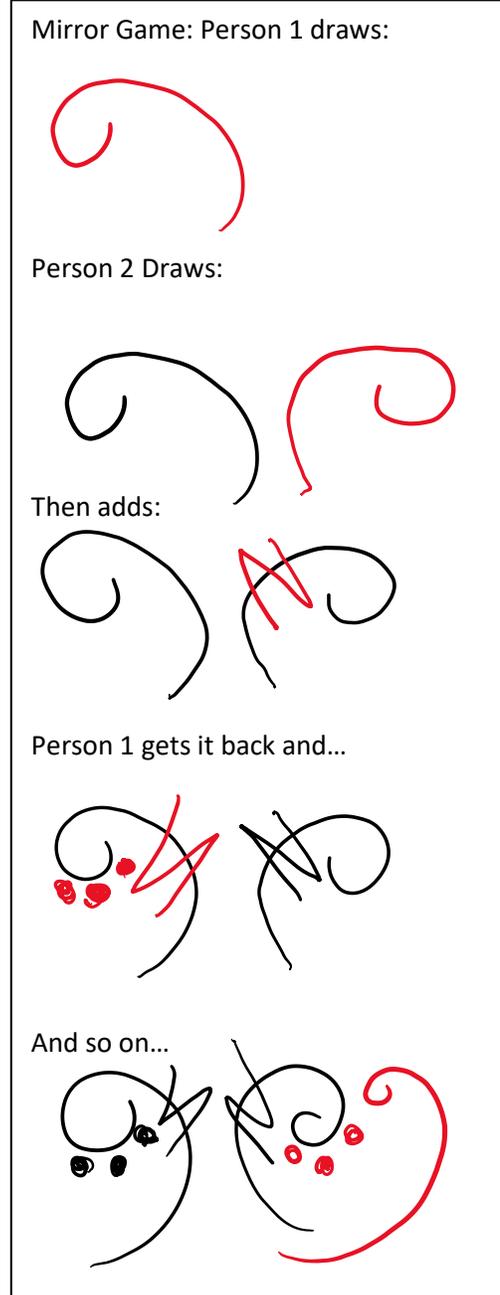
Using two students (or a student with his or her parent) fold a piece of paper in half, and have one person draw something (a line, a shape, something simple) on one side, and hand the paper to the other person. The second person should match the first mark on the blank side, then add a second mark on their own side, then hand it back to the first person. Continue this way, practicing matching elements and lines back and forth. (See diagram to right)

You can even do this on the board with one or more students, or as a suggested activity at home for the week.

**The goal in all these exercises is:**

- 1.) To help the student's brain more easily spot and break down any image into its component OILS
- 2.) To help the student to practice proportions, visual distance and measuring.

Any of these exercises can also be used during the week!



# Drawing and Memory, Math, and More:

Drawing is a Skill, not a Talent. With training and practice, you can improve and even become skilled at drawing. But what other “subjects” can drawing pull upon?

**Drawing draws upon mathematics: proportion, scaling, symmetry, dividing (for example, evenly dividing a form so certain marks are equally spaced apart), perspective (which we will get to in week 5) and creating or replicating patterns.**

Drawing will also teach “*gestalt*”: a German word which means being able to see the whole of something AND its parts, as well as being able to perceive how that thing is not just a collection of its individual parts. Being able to see the whole, the parts, and the combinations therein, helps with problem solving in multiple fields, and drawing naturally teaches this technique.

**Many medical and science colleges at universities are either re-instituting required drawing classes as part of their curriculum, or integrating required drawing as part of the tests and note-taking. The quality of the final drawing is less important than the process of drawing a system, theory, or image under a microscope, because the process of drawing helps students learn and remember more quickly, and more deeply.**

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***“We propose that drawing improves memory by encouraging a seamless integration of semantic, visual, and motor aspects of a memory trace”***

*-Abstract from “The Drawing Effect: Evidence for Reliable and Robust Memory Benefits in Free Recall”*

*by Jeffery O. Wammes, Melissa E. Meade and Myra A. Fernandes*

*Published in Quarterly Journal of Experimental Psychology, Vol 69, Issue 9;*

*16 Feb. 2016*

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In other words, drawing improves memory because it seamlessly combines language, visual concepts, and movement together, all of which encourages better memorization.

**For me, drawing generates  
thinking and vice versa.**

**-Helmut Jahn, Architect**



# SYMMETRY (N)

*(First appeared in English in 1563)*

## **Original meaning:**

*relating to parts, correct proportion,  
how things fit together,*

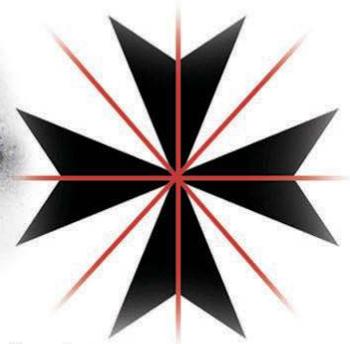
## **Modern definition:**

*An object which you could draw at  
least one line across, and the two  
halves would look like mirror images  
of each other.*

*Many animals have one line of symmetry, usually  
down their middles. This is called "bi-lateral" (Latin  
for "two sided") symmetry, or Reflection symmetry.*



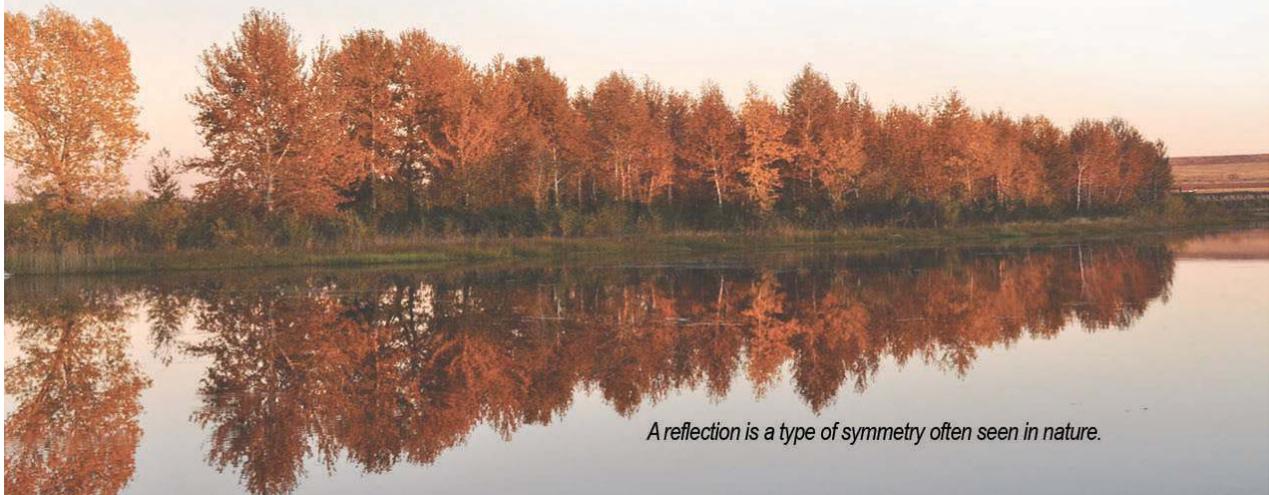
*Some shapes and animals have multiple lines of symmetry  
radiating out from a single point. This is "Radial" or "Rotational"  
symmetry. Both "radial" and "rotational" refer to Latin words  
involving wheels.*



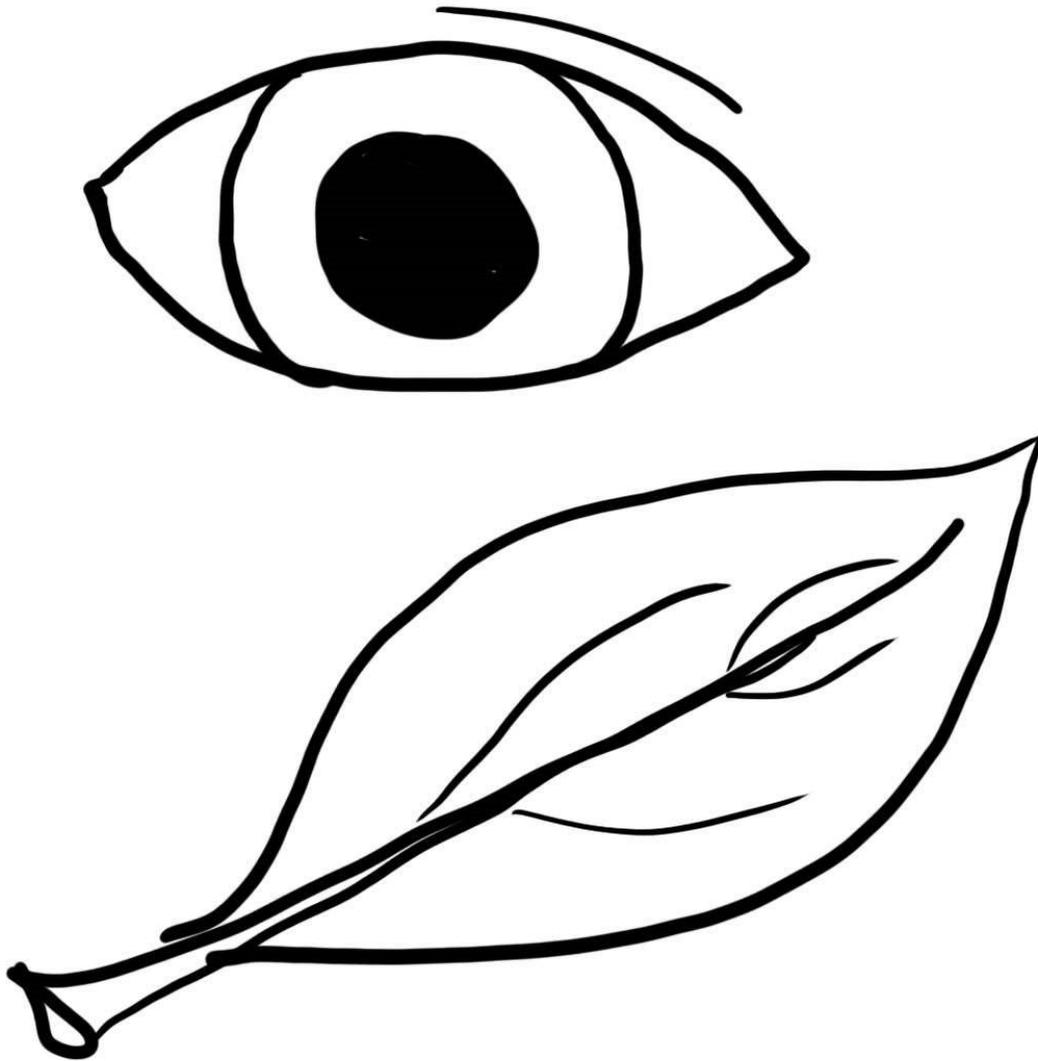
## **ETYMOLOGY:**

*Comes to English through Medieval French (symmétrie) and Latin (symmetria) and  
ultimately from the Greek word "symmetria" (Συμμετρία)*

*Symmetria has two roots: "Sym-", meaning "together" and "metron" meaning "to  
measure", ergo, "to measure together"*



*A reflection is a type of symmetry often seen in nature.*





**“The trouble with progress is that it tends to happen slowly and quietly. It's not necessarily going to shout about itself, or make the nightly news ...”**

**-Aaron Koblin,**  
American artist, entrepreneur, and computer programmer

1982 -



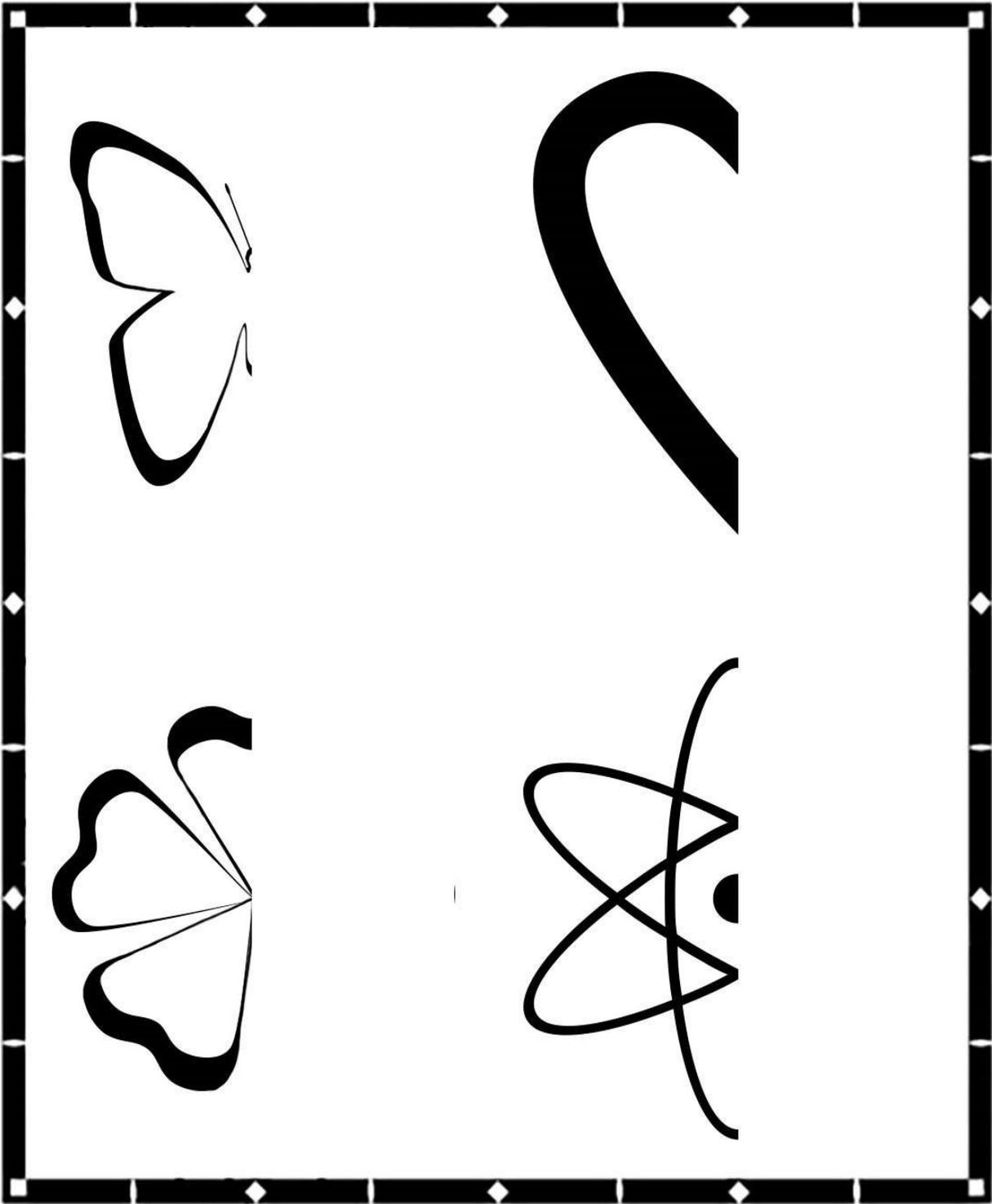
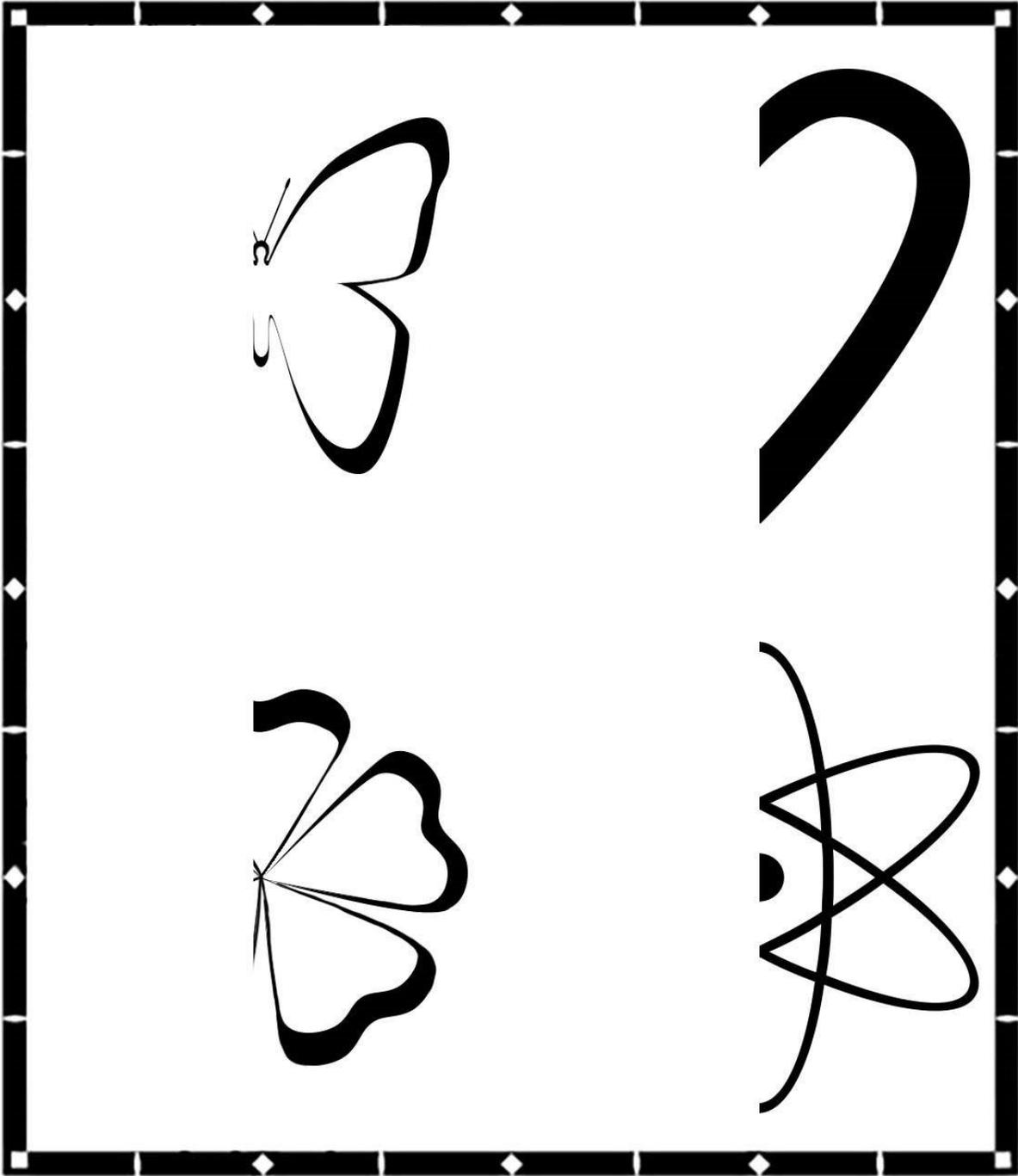
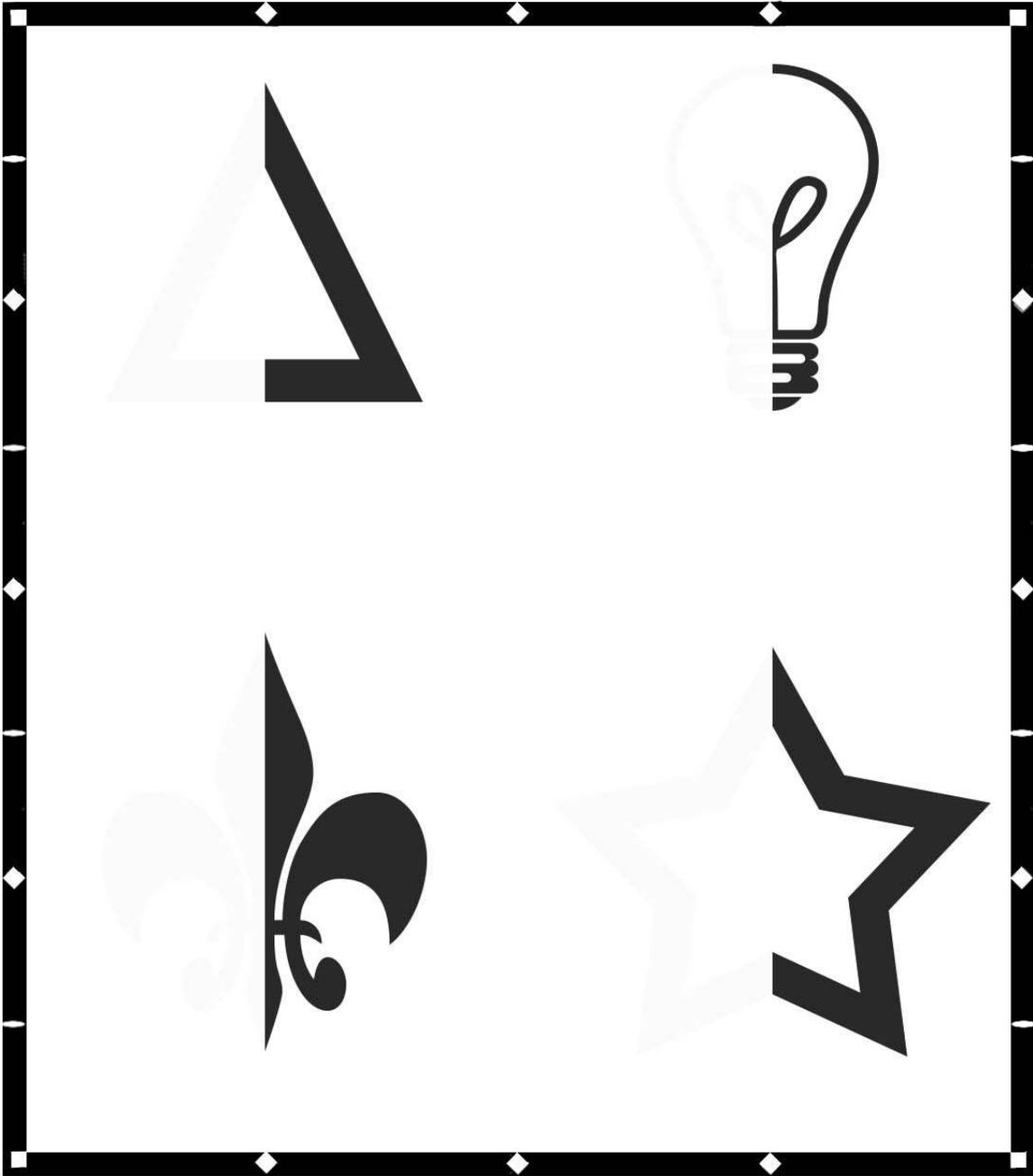


Figure 1: Simple Shapes for the right handed draftsman





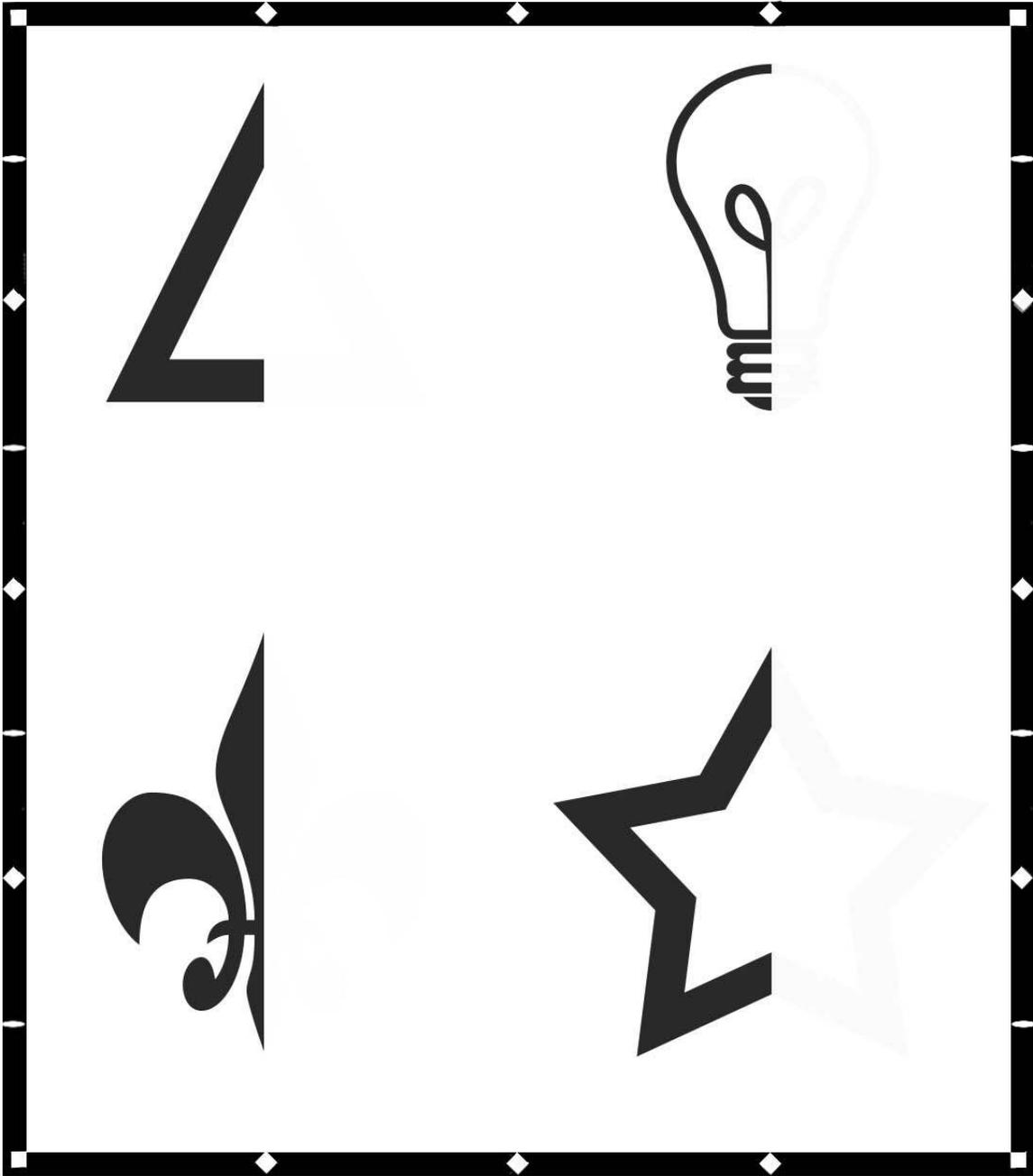


Figure 2: Simple Shapes for the Left Handed Draftsman

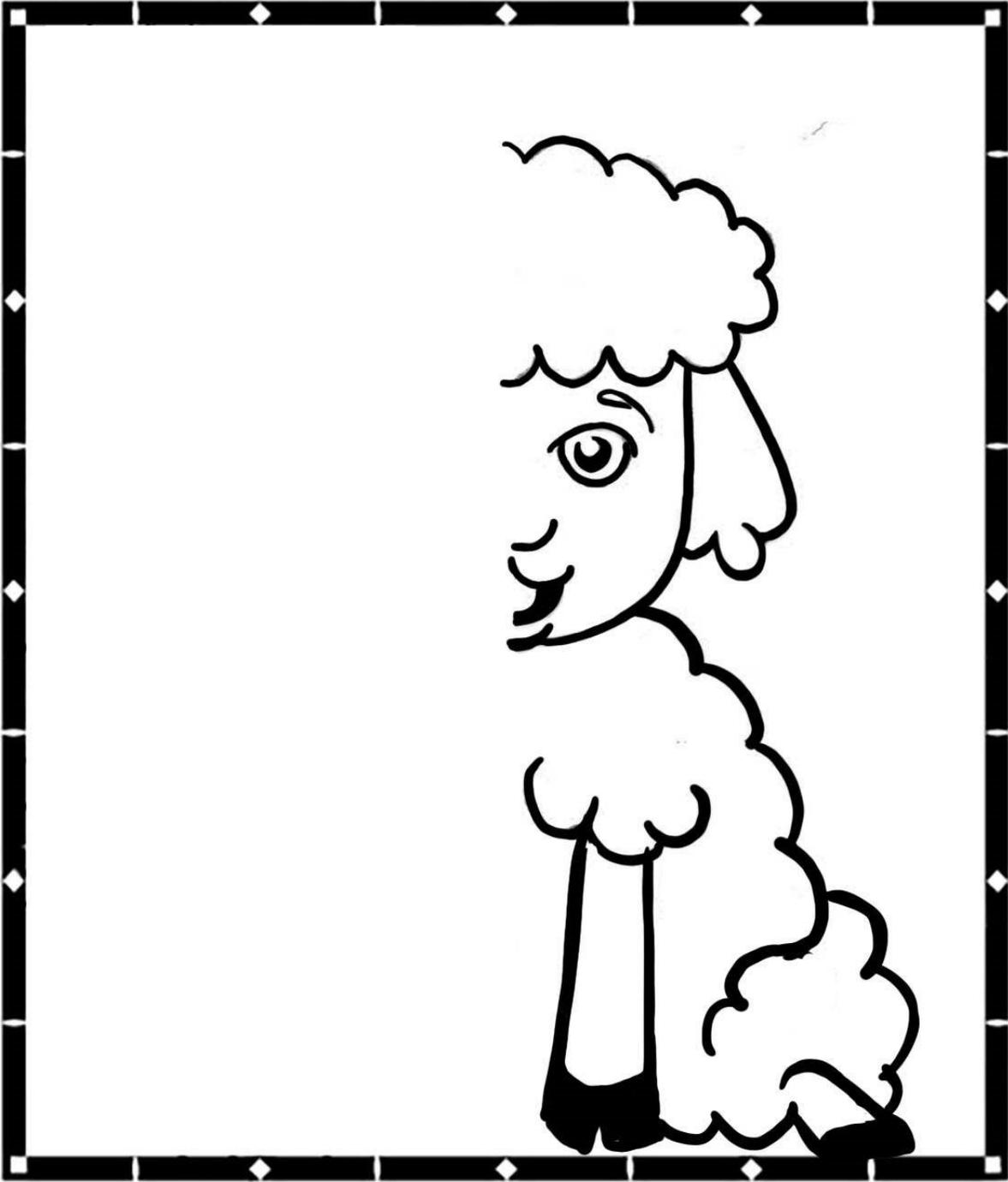


Figure 3: Lamb for the Left Handed Draftsperson



*Figure 4: Lamb for the Right Handed Draftsperson*

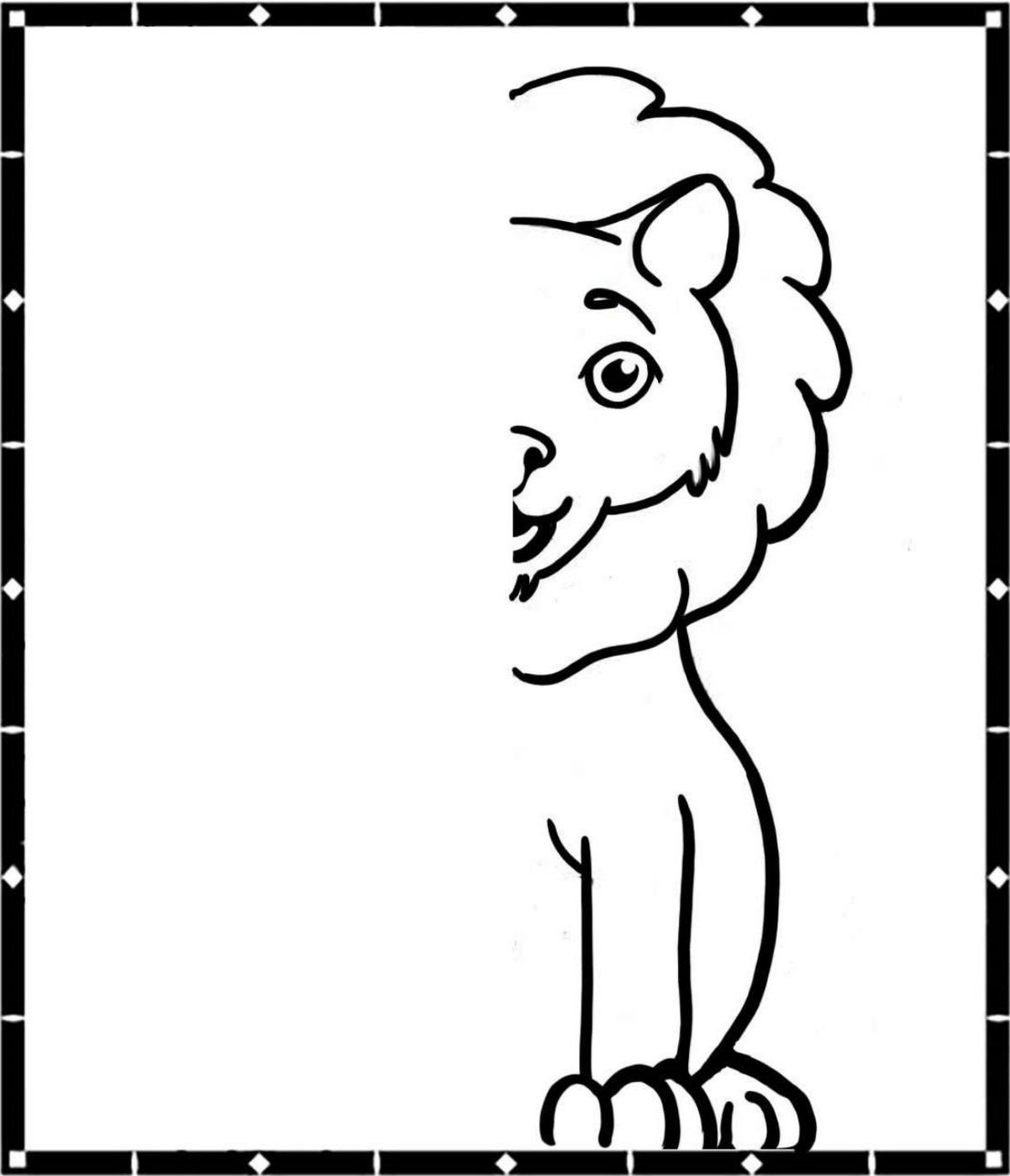
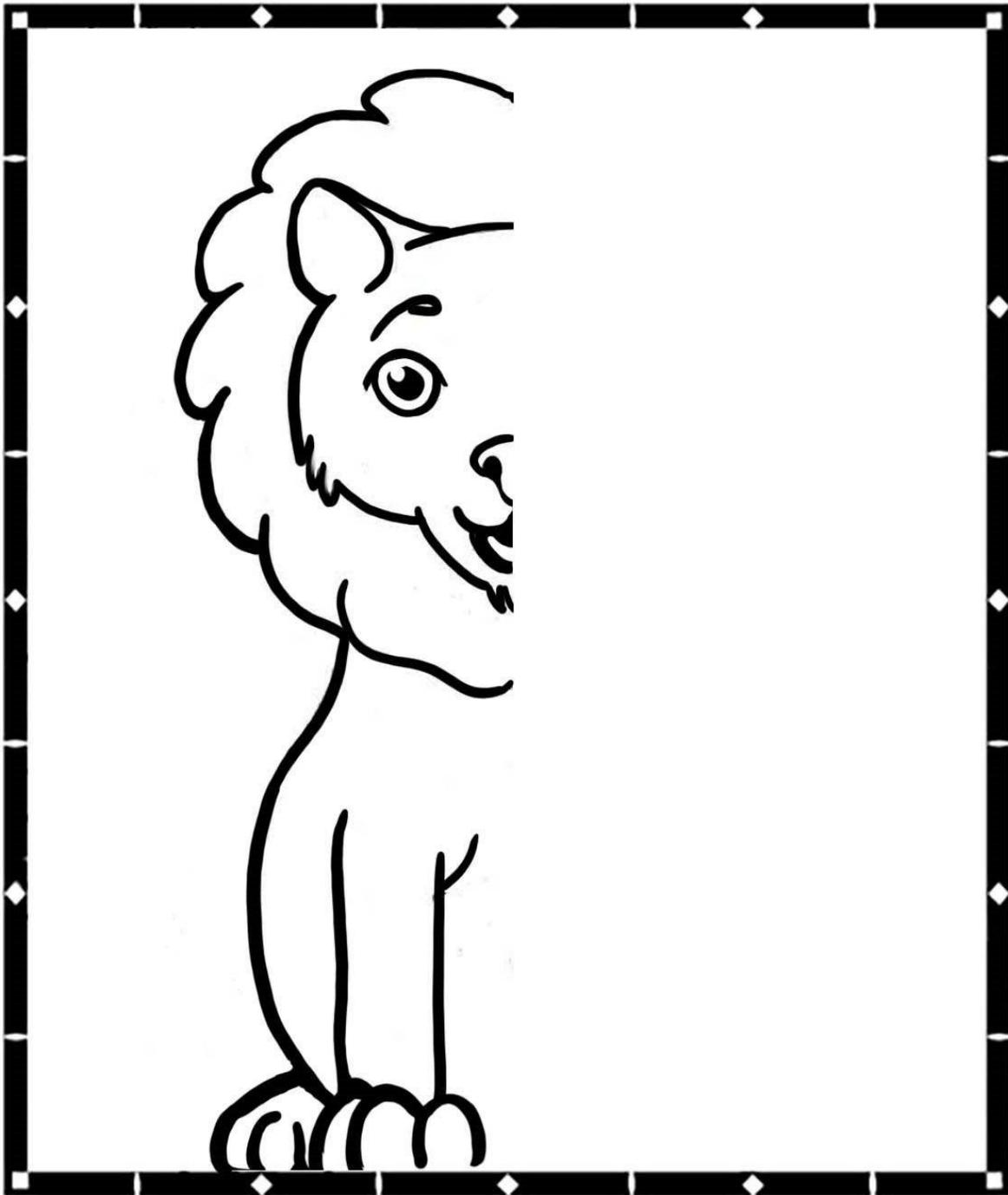
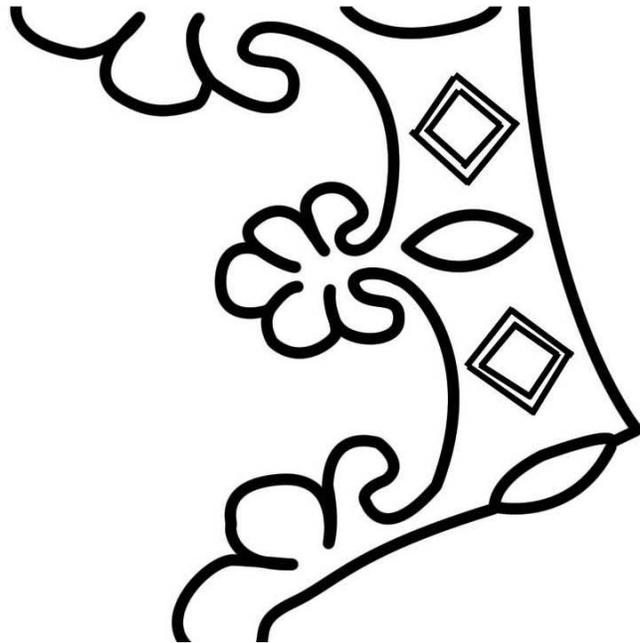


Figure 5: Lion for the Left Handed Draftsperson



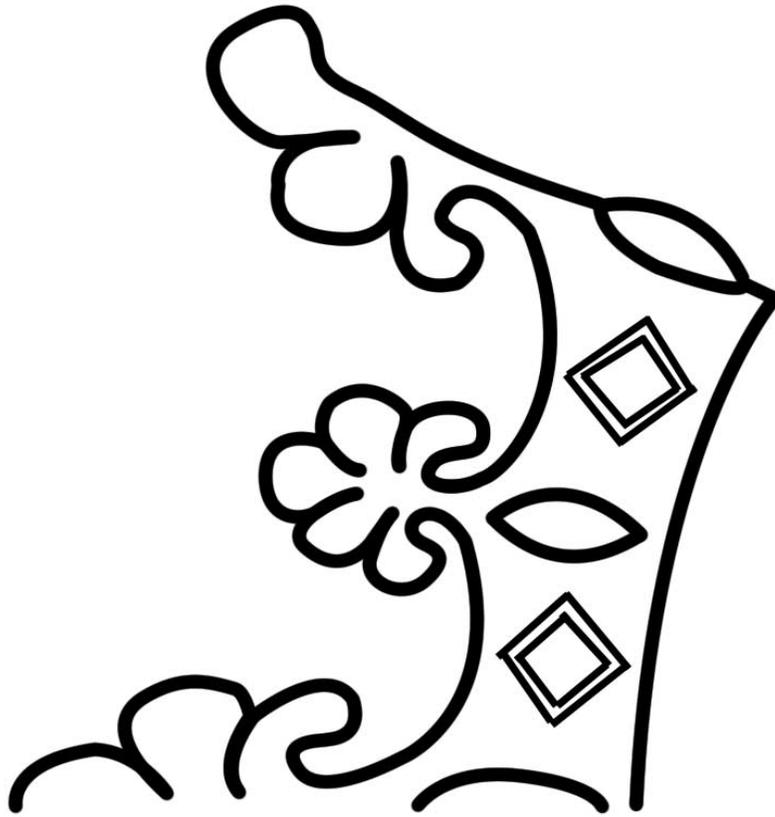
*Figure 6: Lion for the Right Handed Draftsperson*



## Crown of Medieval England

Based on multiple illustrations and tomb effigies of William I through Henry III

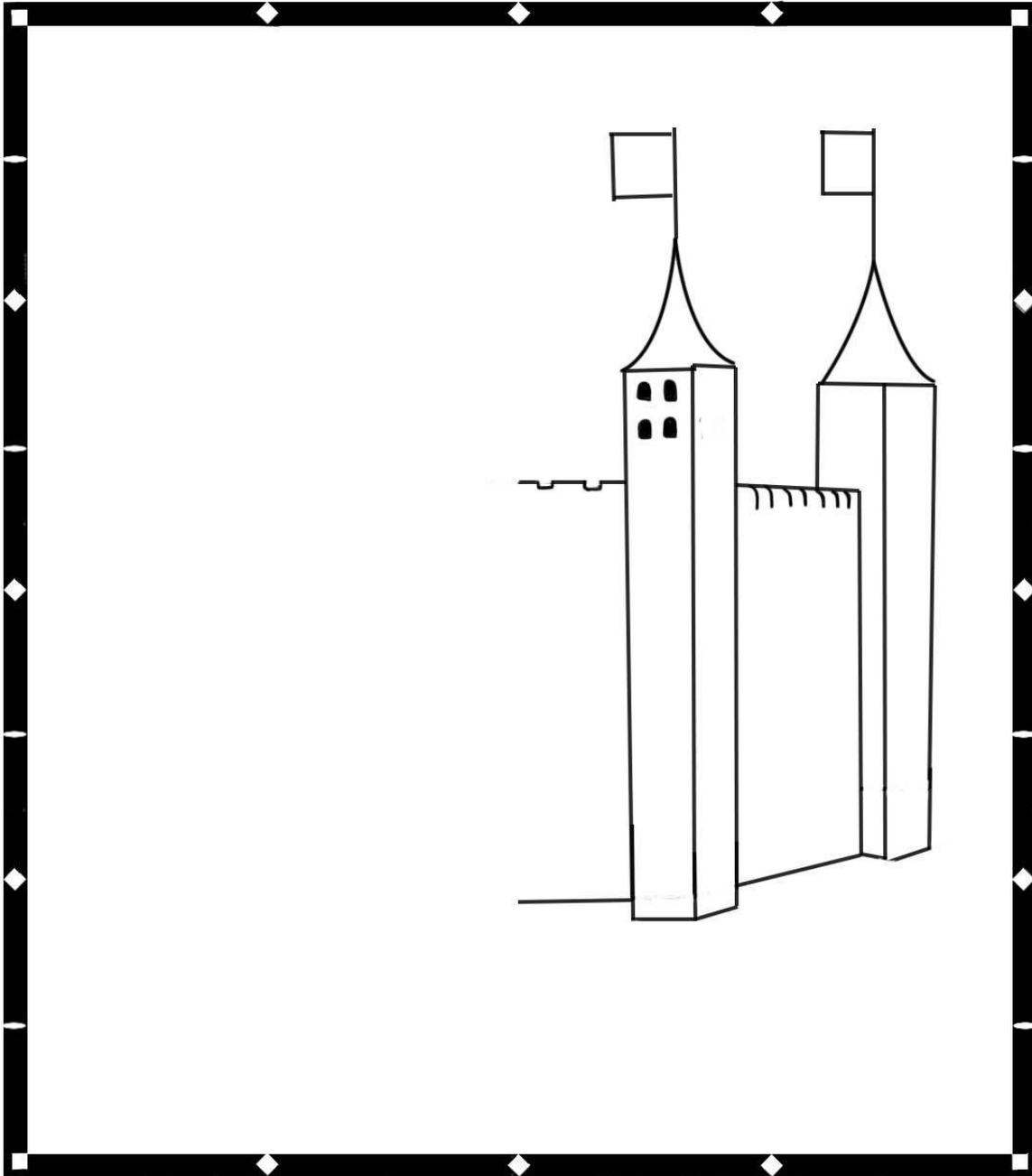
Crown of Medieval England for the right-handed draftsman



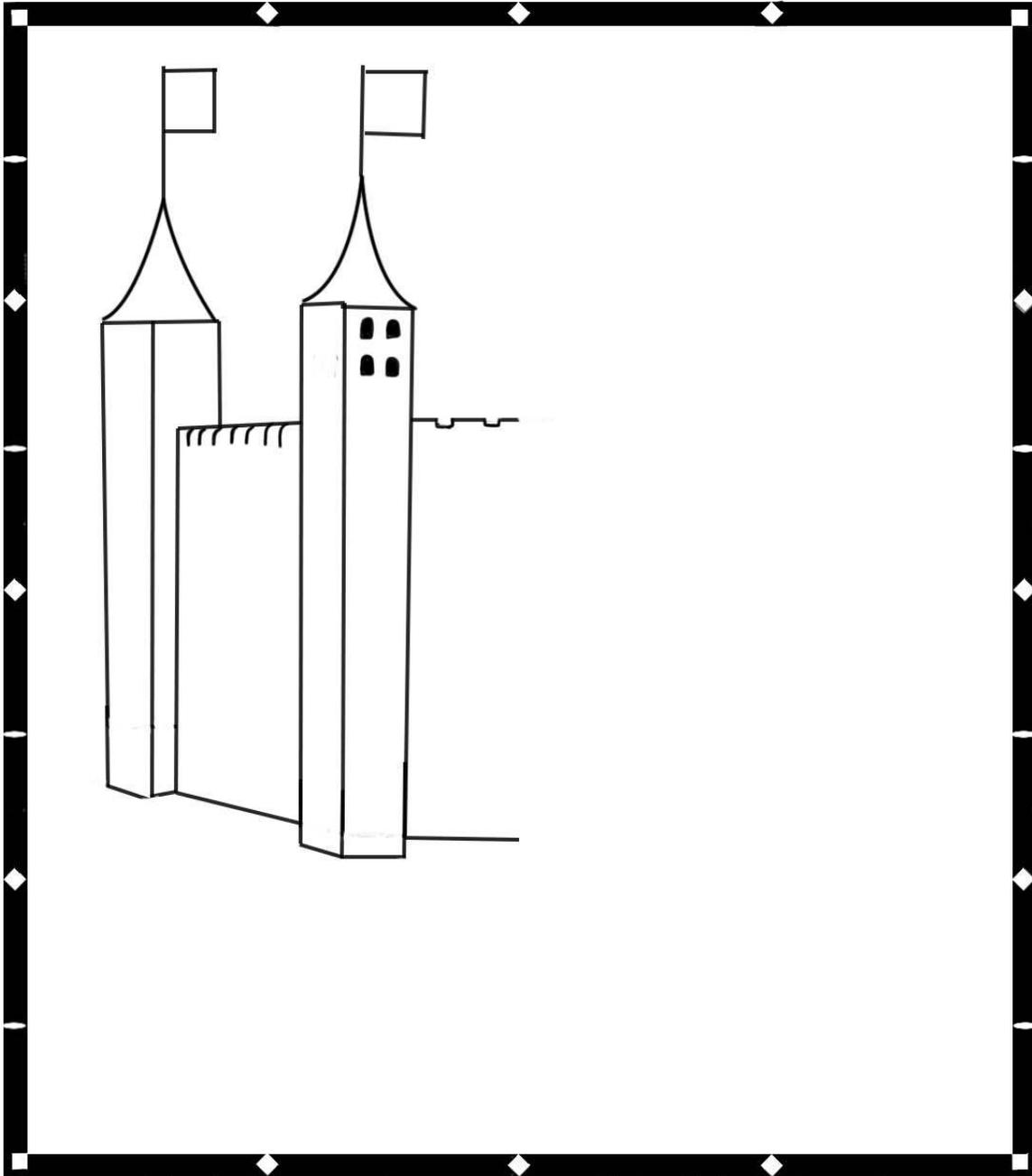
## Crown of Medieval England

Based on multiple illustrations and tomb effigies of William I through Henry III

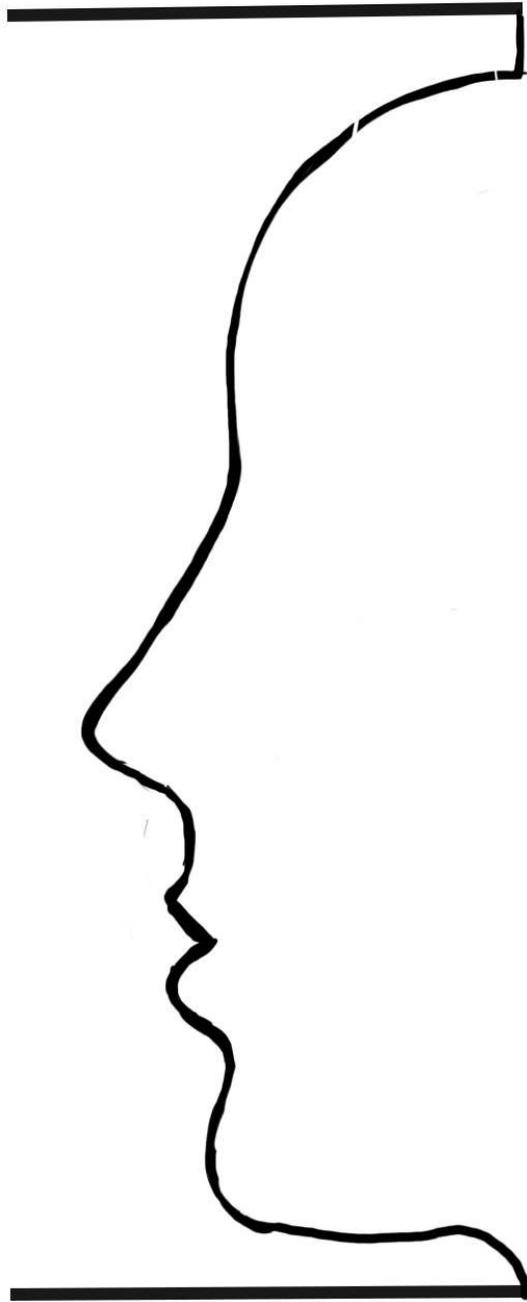
Crown of Medieval England—for left handed draftsmen



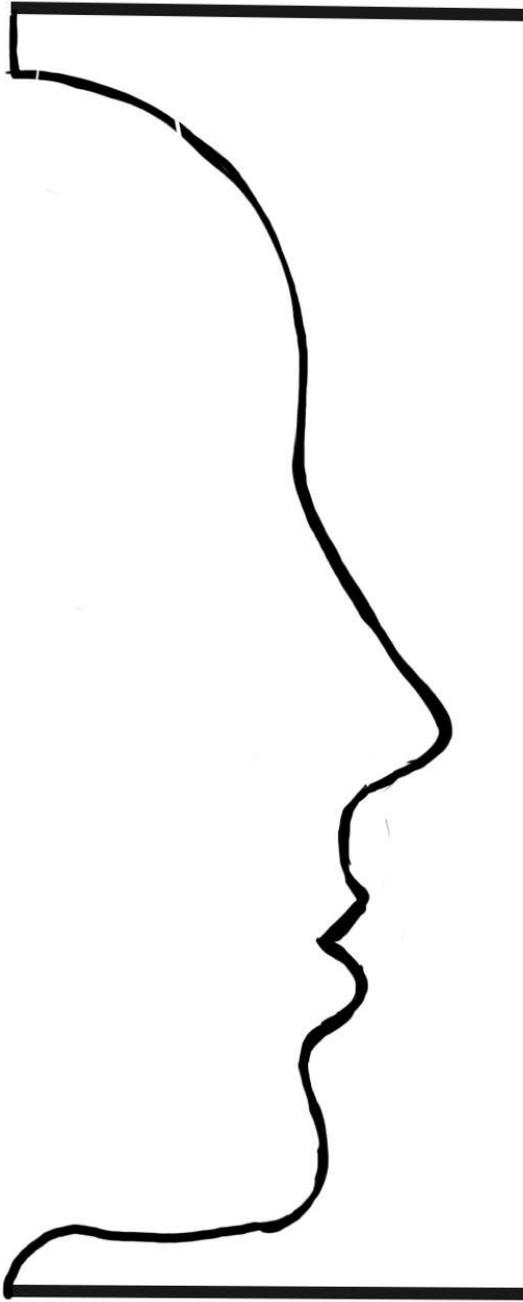
**WILLIAM THE CONQUEROR BUILDS THE TOWER OF LONDON**  
After conquering England, William the Conqueror built the 'White Tower', now the center of the Tower of London. It is a nearly symmetrical tower. Based on a 13th century illustration.



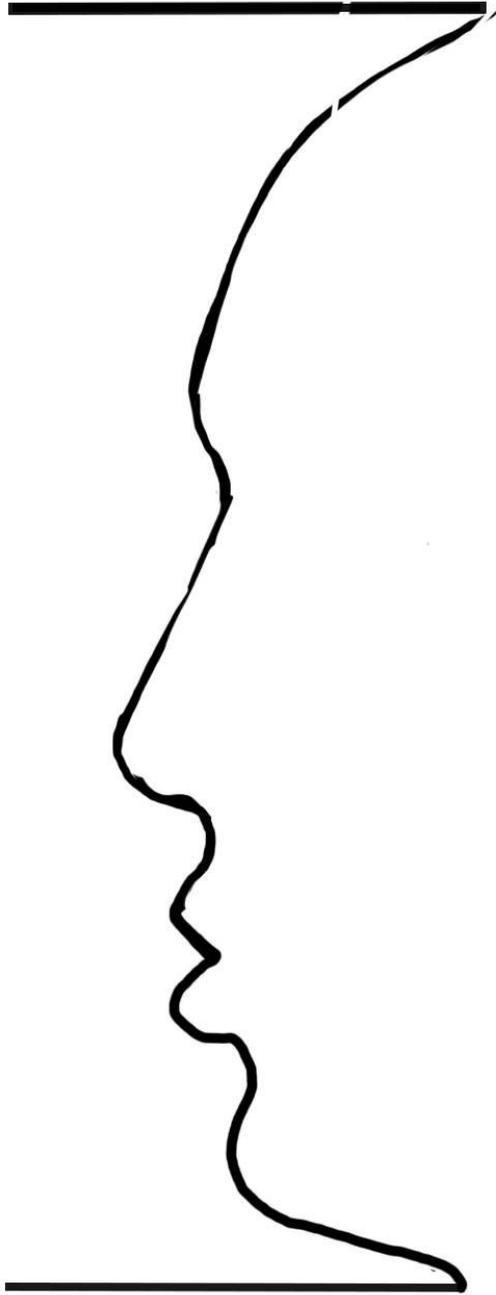
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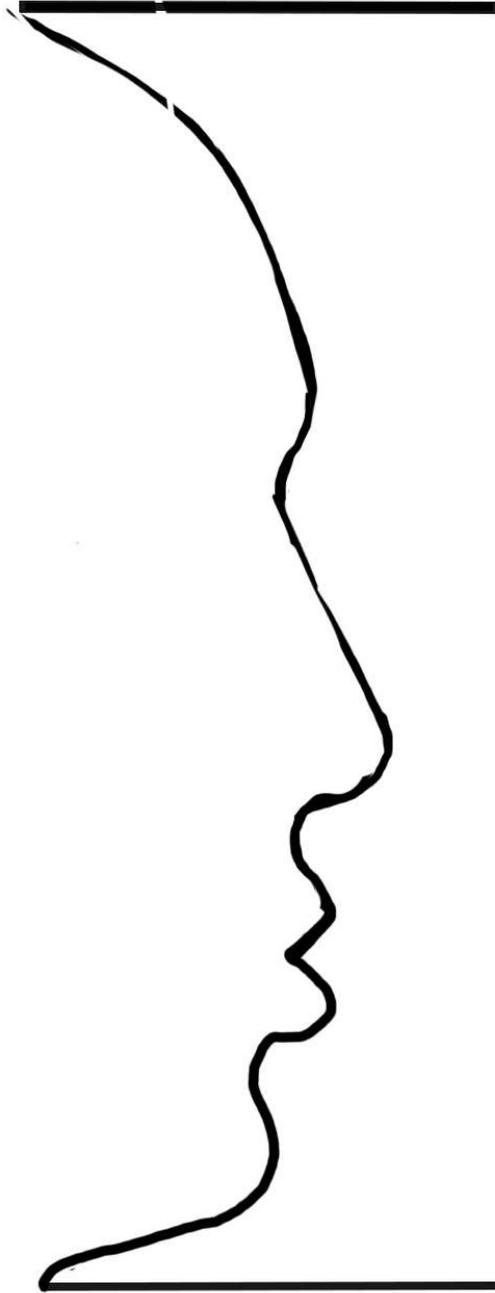
Face-Vase #1 for left-handed draftsmen



Face-Vase #1 for right-handed draftsmen



Face-Vase #2 for left handed draftsmen



Face-Vase #2 for right handed draftsmen

## At Home Suggestions:

Keep looking for examples of symmetry during the week: insects: animals, leaves, reflections, things with mirrors....there's many examples of symmetry.

Look at simple shapes—cut some out of paper, and ask: How many ways can we fold this paper and have two exact same sides? Try:

- Squares & Rectangle
- Circles & Ovals
- Triangles (Equilateral, scalene, and isosceles)
- Hexagon, Octagon, Septagon?

Cut these images along the folded “line of symmetry” and ask the child to draw the other half.

If you find a symmetrical image (magazine, online, ect.) ask, “what OILS would you use to complete this picture if I cut it in half here? 29

Google “Mirror Image Worksheets”, and you’ll pull up a lot of suggestions you can print off and draw.

Continue allowing lots of free drawing and open play with art supplies, in addition to deliberate lessons a couple of times a week. Don’t worry about realism yet, keeping things light and fun will yield results in time!

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“I give no points for the aesthetic quality of a doodle, because the perceived skill [of the artist] has nothing to do with the quality of the learning experience for the doodler.”

*-Sunni Brown*

*Author of “The Doodle Revolution”*

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